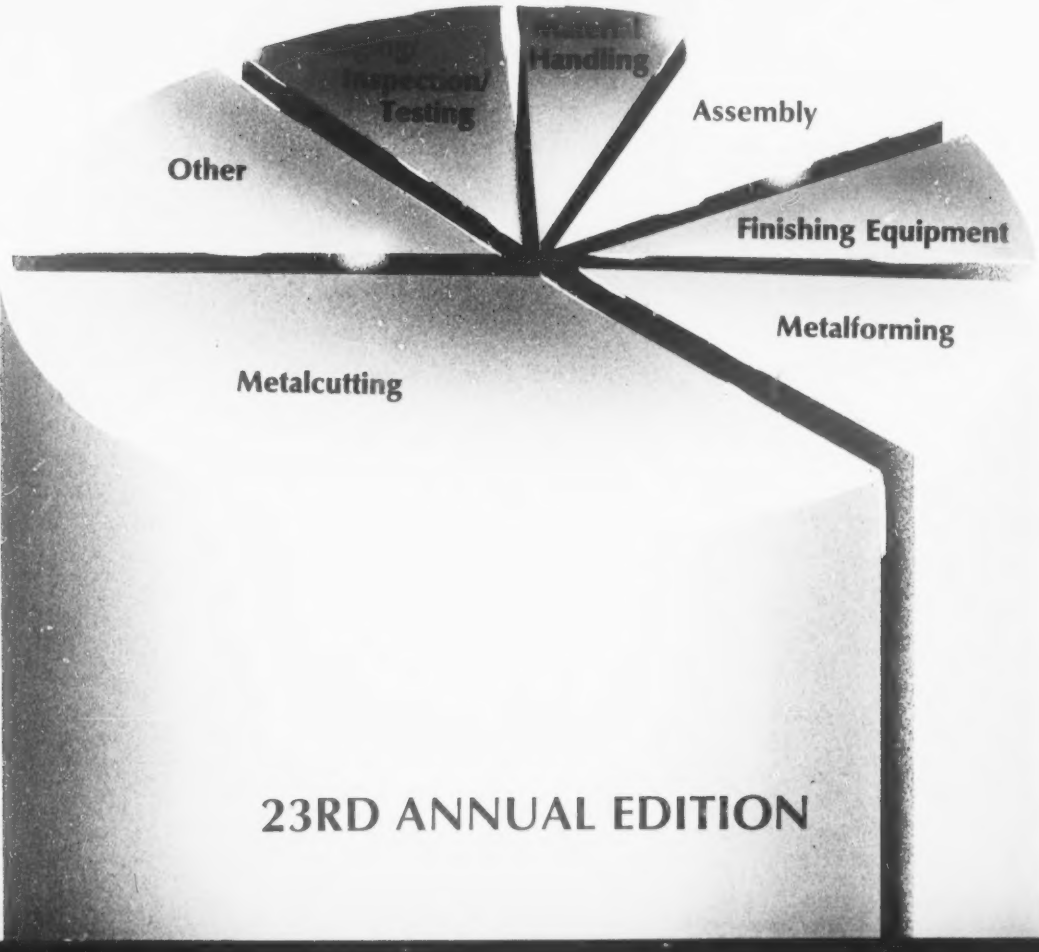
PRODUCTION
THE MAGAZINE OF MANUFACTURING MANAGEMENT

1991 Capital Spending Survey



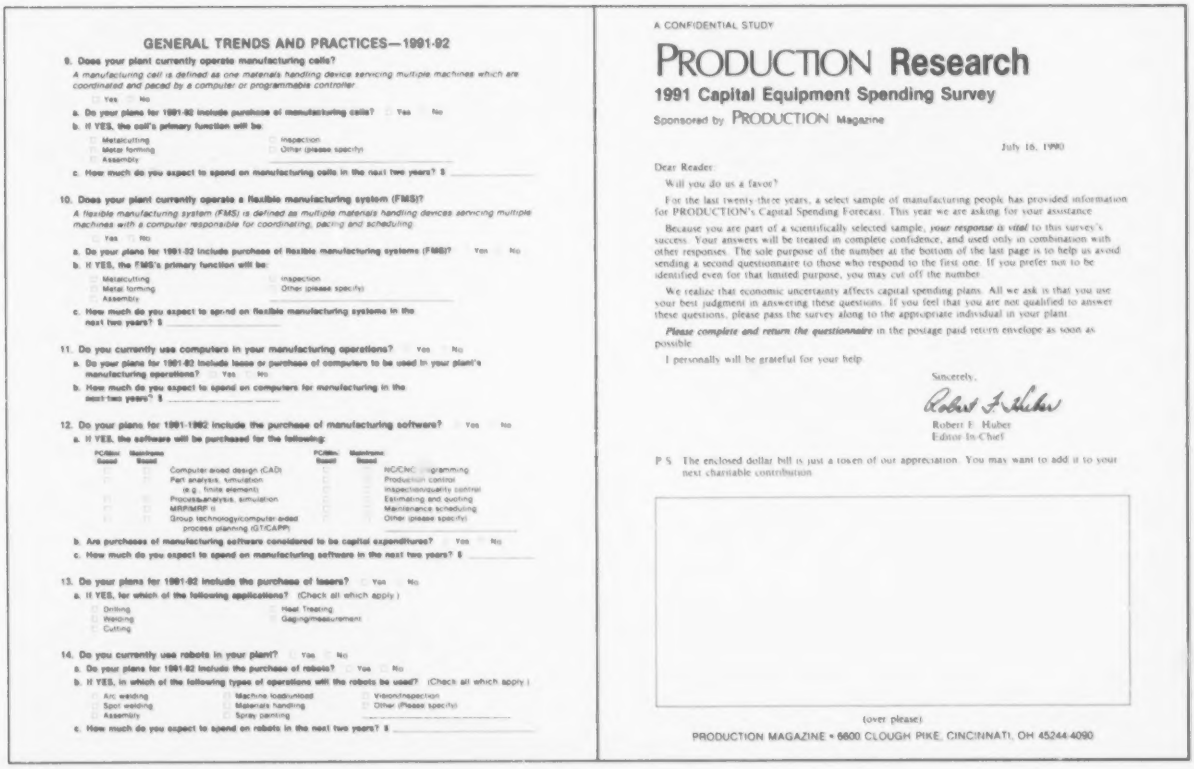
23RD ANNUAL EDITION

1991 Capital Spending

METHODOLOGY

Questionnaires were mailed to a universe of 10,000 plants in the discrete parts manufacturing industries: SIC 34, Fabricated Metal Products; SIC 35, Machinery, except Electrical; SIC 36, Electrical Machinery; SIC 37, Transportation Equipment; SIC 38, Instruments; and a few selected companies in the Metal Furniture portion of SIC 25. The universe, by employment, is made up of every plant PRODUCTION Magazine reaches employing 250 and over and every Nth plant reached employing less than 250 until a universe of 10,000 plants was assembled. We mail to upper echelon readers—presidents; executive vice presidents; general managers; vice presidents of manufacturing and/or operations; plant, works or factory managers and superintendents; directors of production engineering; and managers of manufacturing—people with lateral interests and access to the dollars and plans needed to complete our questionnaire. We mail one questionnaire per plant, using a computer program to select the highest title reached on an alphabetical search of each selected plant galley. We conducted the survey July 16th, 1990, and cut off the response August 17, 1990.

As of the cut-off date, 2,901 surveys were returned (29% response rate). 2,715 surveys were determined usable. Unless otherwise indicated, all figures are percentages.



GENERAL TRENDS AND PRACTICES—1991-92

9. Does your plant currently operate manufacturing cells?

A manufacturing cell is defined as one materials handling device servicing multiple machines which are coordinated and paced by a computer or programmable controller.

☐ Yes ☐ No

a. Do your plans for 1991-92 include purchase of manufacturing cells? ☐ Yes ☐ No

b. If YES, the cell's primary function will be:

☐ Metalcutting ☐ Inspection
☐ Metal forming ☐ Other (please specify)
☐ Assembly

c. How much do you expect to spend on manufacturing cells in the next two years? $ _____

10. Does your plant currently operate a flexible manufacturing system (FMS)?

A flexible manufacturing system (FMS) is defined as multiple materials handling devices servicing multiple machines with a computer responsible for coordinating, pacing and scheduling.

☐ Yes ☐ No

a. Do your plans for 1991-92 include purchase of flexible manufacturing systems (FMS)? ☐ Yes ☐ No

b. If YES, the FMS's primary function will be:

☐ Metalcutting ☐ Inspection
☐ Metal forming ☐ Other (please specify)
☐ Assembly

c. How much do you expect to spend on flexible manufacturing systems in the next two years? $ _____

11. Do you currently use computers in your manufacturing operations? ☐ Yes ☐ No

a. Do your plans for 1991-92 include lease or purchase of computers to be used in your plant's manufacturing operations? ☐ Yes ☐ No

b. How much do you expect to spend on computers for manufacturing in the next two years? $ _____

12. Do your plans for 1991-1992 include the purchase of manufacturing software? ☐ Yes ☐ No

a. If YES, the software will be purchased for the following:

PC/Micro Based	Mainframe Based		PC/Micro Based	Mainframe Based	
☐	☐	Computer-aided design (CAD)	☐	☐	NC/CNC programming
☐	☐	Part analysis, simulation (e.g., finite element)	☐	☐	Production control
☐	☐	Process analysis, simulation	☐	☐	Inspection/quality control
☐	☐	MRP/MRP II	☐	☐	Estimating and quoting
☐	☐	Group technology/computer-aided process planning (GT/CAPP)	☐	☐	Maintenance scheduling
			☐	☐	Other (please specify) _____

b. Are purchases of manufacturing software considered to be capital expenditures? ☐ Yes ☐ No

c. How much do you expect to spend on manufacturing software in the next two years? $ _____

13. Do your plans for 1991-92 include the purchase of lasers? ☐ Yes ☐ No

a. If YES, for which of the following applications? (Check all which apply.)

☐ Drilling ☐ Heat Treating
☐ Welding ☐ Gaging/measurement
☐ Cutting

14. Do you currently use robots in your plant? ☐ Yes ☐ No

a. Do your plans for 1991-92 include the purchase of robots? ☐ Yes ☐ No

b. If YES, in which of the following types of operations will the robots be used? (Check all which apply.)

☐ Arc welding ☐ Machine loading/unload ☐ Vision/inspection
☐ Spot welding ☐ Materials handling ☐ Other (Please specify)
☐ Assembly ☐ Spray painting _____

c. How much do you expect to spend on robots in the next two years? $ _____

A CONFIDENTIAL STUDY

PRODUCTION **Research**

1991 Capital Equipment Spending Survey

Sponsored by PRODUCTION Magazine

July 16, 1990

Dear Reader:

Will you do us a favor?

For the last twenty three years, a select sample of manufacturing people has provided information for PRODUCTION's Capital Spending Forecast. This year we are asking for your assistance.

Because you are part of a scientifically selected sample, *your response is vital* to this survey's success. Your answers will be treated in complete confidence, and used only in combination with other responses. The sole purpose of the number at the bottom of the last page is to help us avoid sending a second questionnaire to those who respond to the first one. If you prefer not to be identified even for that limited purpose, you may cut off the number.

We realize that economic uncertainty affects capital spending plans. All we ask is that you use your best judgment in answering these questions. If you feel that you are not qualified to answer these questions, please pass the survey along to the appropriate individual in your plant.

Please complete and return the questionnaire in the postage paid return envelope as soon as possible.

I personally will be grateful for your help.

Sincerely,

Robert F. Huber
Editor-In-Chief

P.S. The enclosed dollar bill is just a token of our appreciation. You may want to add it to your next charitable contribution.

(over please)

PRODUCTION MAGAZINE • 6600 CLOUGH PIKE, CINCINNATI, OH 45244-4090

Survey & Forecast

RESPONSE

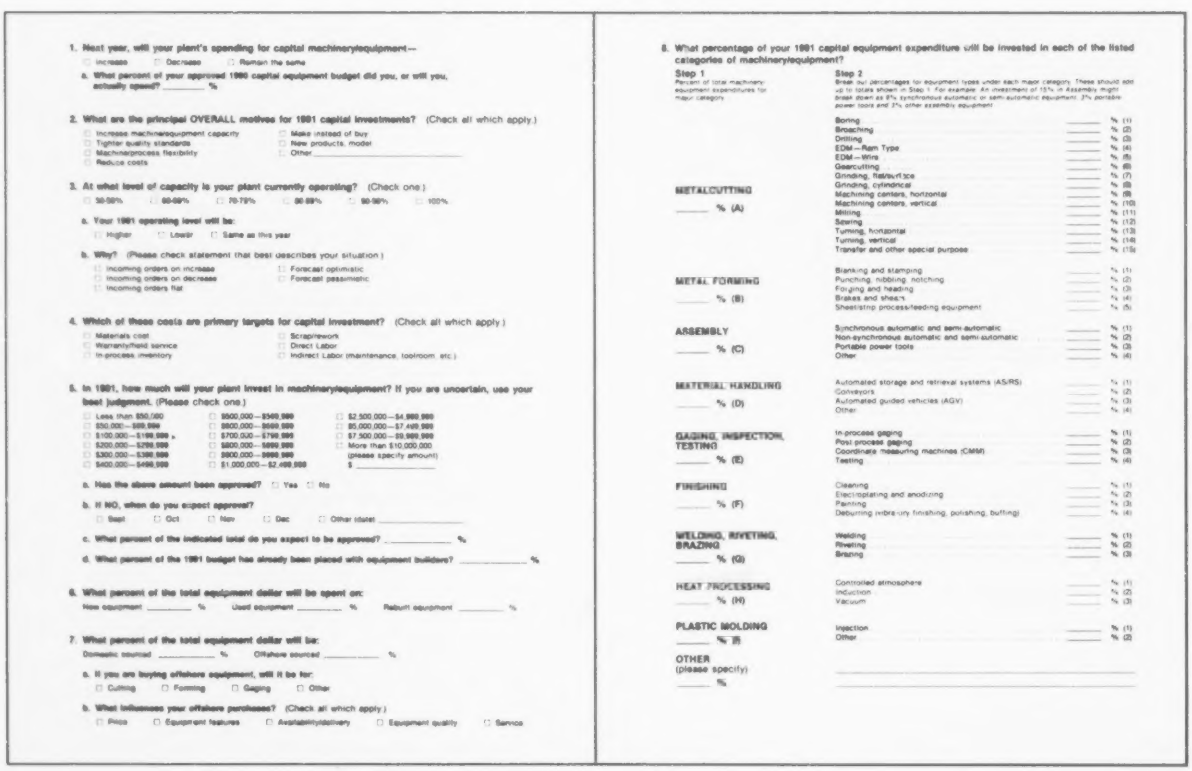
The returns, broken down by plant size, are as follows:

Plant Employment	Percentage Return 1991	Percentage Return 1990	Percentage Return 1989	Percentage Return 1988
Less than 20	**9.1**	9.2	7.9	8.4
20-49	**9.6**	10.1	10.5	15.7
50-99	**10.2**	12.8	12.2	18.0
100-499	**42.0**	41.9	41.3	31.0
500-999	**15.1**	13.4	14.7	14.2
1,000-2,499	**8.9**	7.7	8.1	7.8
2,500 and Over	**5.1**	4.9	5.3	4.9

HIGHLIGHTS

Page

1991 Capital Spending Total 6
Domestic vs. Offshore Sourcing 7
Capital Expenditures By Equipment Type . . 8
Cells 10
Systems 11
Computers 12
Software 13
Lasers and Robots 14



1. **Next year, will your plant's spending for capital machinery/equipment—**
   ☐ Increase ☐ Decrease ☐ Remain the same
   a. **What percent of your approved 1990 capital equipment budget did you, or will you, actually spend?** _____ %

2. **What are the principal OVERALL motives for 1991 capital investments?** (Check all which apply.)
   ☐ Increase machine/equipment capacity ☐ Make instead of buy
   ☐ Tighter quality standards ☐ New products, model
   ☐ Machine/process flexibility ☐ Other _____
   ☐ Reduce costs

3. **At what level of capacity is your plant currently operating?** (Check one.)
   ☐ 50-59% ☐ 60-69% ☐ 70-79% ☐ 80-89% ☐ 90-99% ☐ 100%
   a. **Your 1991 operating level will be:**
   ☐ Higher ☐ Lower ☐ Same as this year
   b. **Why?** (Please check statement that best describes your situation.)
   ☐ Incoming orders on increase ☐ Forecast optimistic
   ☐ Incoming orders on decrease ☐ Forecast pessimistic
   ☐ Incoming orders flat

4. **Which of these costs are primary targets for capital investment?** (Check all which apply.)
   ☐ Materials cost ☐ Scrap/rework
   ☐ Warranty/field service ☐ Direct Labor
   ☐ In-process inventory ☐ Indirect Labor (maintenance, toolroom, etc.)

5. **In 1991, how much will your plant invest in machinery/equipment?** If you are uncertain, use your best judgment. (Please check one.)
   ☐ Less than $50,000 ☐ $500,000—$749,999 ☐ $2,500,000—$4,999,999
   ☐ $50,000—$99,999 ☐ $750,000—$999,999 ☐ $5,000,000—$7,499,999
   ☐ $100,000—$199,999 ☐ $700,000—$799,999 ☐ $7,500,000—$9,999,999
   ☐ $200,000—$299,999 ☐ $800,000—$899,999 ☐ More than $10,000,000 (please specify amount)
   ☐ $300,000—$399,999 ☐ $900,000—$999,999 $ _____
   ☐ $400,000—$499,999 ☐ $1,000,000—$2,499,999
   a. **Has the above amount been approved?** ☐ Yes ☐ No
   b. **If NO, when do you expect approval?**
   ☐ Sept ☐ Oct ☐ Nov ☐ Dec ☐ Other (date) _____
   c. **What percent of the indicated total do you expect to be approved?** _____ %
   d. **What percent of the 1991 budget has already been placed with equipment builders?** _____ %

6. **What percent of the total equipment dollar will be spent on:**
   New equipment _____ % Used equipment _____ % Rebuilt equipment _____ %

7. **What percent of the total equipment dollar will be:**
   Domestic sourced _____ % Offshore sourced _____ %
   a. **If you are buying offshore equipment, will it be for:**
   ☐ Cutting ☐ Forming ☐ Gaging ☐ Other
   b. **What influences your offshore purchases?** (Check all which apply.)
   ☐ Price ☐ Equipment features ☐ Availability/delivery ☐ Equipment quality ☐ Service

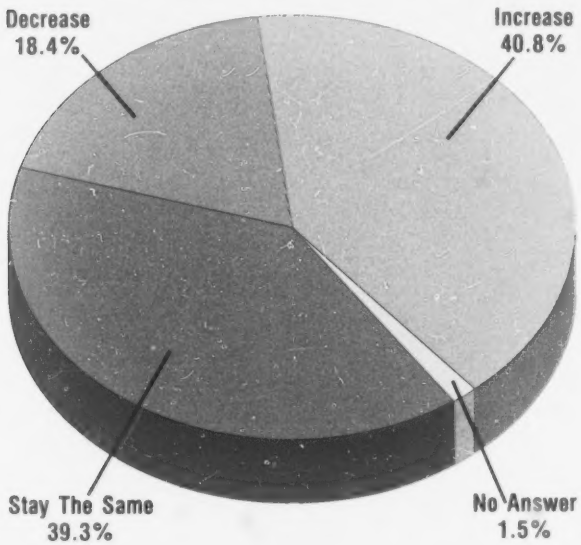
8. **What percentage of your 1991 capital equipment expenditure will be invested in each of the listed categories of machinery/equipment?**

Step 1	Step 2
Percent of total machinery equipment expenditures for major category	Break out percentages for equipment types under each major category. These should add up to totals shown in Step 1. For example: An investment of 15% in Assembly might break down as 8% synchronous automatic or semi-automatic equipment, 3% portable power tools and 3% other assembly equipment.
	Boring _____ % (1)
	Broaching _____ % (2)
	Drilling _____ % (3)
	EDM—Ram Type _____ % (4)
	EDM—Wire _____ % (5)
	Gear cutting _____ % (6)
	Grinding, flat/surface _____ % (7)
	Grinding, cylindrical _____ % (8)
METALCUTTING	Machining centers, horizontal _____ % (9)
_____ % (A)	Machining centers, vertical _____ % (10)
	Milling _____ % (11)
	Sawing _____ % (12)
	Turning, horizontal _____ % (13)
	Turning, vertical _____ % (14)
	Transfer and other special purpose _____ % (15)
	Blanking and stamping _____ % (1)
	Punching, nibbling, notching _____ % (2)
METAL FORMING	Forging and heading _____ % (3)
_____ % (B)	Brakes and sheers _____ % (4)
	Sheet/strip processing/feeding equipment _____ % (5)
	Synchronous automatic and semi-automatic _____ % (1)
ASSEMBLY	Non-synchronous automatic and semi-automatic _____ % (2)
_____ % (C)	Portable power tools _____ % (3)
	Other _____ % (4)
	Automated storage and retrieval systems (AS/RS) _____ % (1)
MATERIAL HANDLING	Conveyors _____ % (2)
_____ % (D)	Automated guided vehicles (AGV) _____ % (3)
	Other _____ % (4)
	In-process gaging _____ % (1)
GAGING, INSPECTION, TESTING	Post process gaging _____ % (2)
_____ % (E)	Coordinate measuring machines (CMM) _____ % (3)
	Testing _____ % (4)
	Cleaning _____ % (1)
FINISHING	Electroplating and anodizing _____ % (2)
_____ % (F)	Painting _____ % (3)
	Deburring (robotic), finishing, polishing, buffing) _____ % (4)
	Welding _____ % (1)
WELDING, RIVETING, BRAZING	Riveting _____ % (2)
_____ % (G)	Brazing _____ % (3)
	Controlled atmosphere _____ % (1)
HEAT PROCESSING	Induction _____ % (2)
_____ % (H)	Vacuum _____ % (3)
PLASTIC MOLDING	Injection _____ % (1)
_____ % (I)	Other _____ % (2)
OTHER (please specify)	
_____ %	

Summary of Findings

1. Next year will your plant's spending for capital machinery/equipment...

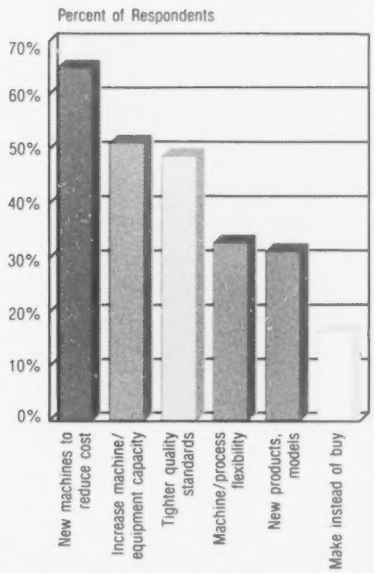
	1991	1990	1989	1988	1987
Increase	**40.8**	43.7	47.5	41.2	35.4
Decrease	**18.4**	15.3	13.4	14.9	21.2
Remain the same	**39.3**	39.2	37.2	41.2	40.6
No answer	**1.5**	1.8	1.9	2.7	2.9
Total	**100.0**	100.0	100.0	100.0	100.0



1a. What percent of your approved 1990 capital equipment budget did you, or will you, actually spend?

74 (average) as of August, 1990 (Median was 90%)
74 (average) as of August, 1989 (Median was 94%)
74 (average) as of August, 1988 (Median was 95%)
68 (average) as of September, 1987 (Median was 95%)

What are the principal OVERALL motives for 1991 capital investments?



2. What are the principal OVERALL motives for 1991 capital investments?

	1991	1990	1989
New machines to reduce costs	**65.1**	59.4	60.2
Increase machine/equipment capacity	**51.3**	52.4	53.3
Tighter quality standards	**48.9**	47.2	45.9
Machine/process flexibility	**32.9**	28.0	29.2
New products, models	**31.3**	29.9	31.7
Make instead of buy	**16.4**	15.6	15.8

3. At what level of capacity is your plant currently operating?

	1991	1990	1989	1988	1987
(Average capacity level reported August preceding survey year)	**78**	79	80	77	75

3a. Your 1991 operating level will be:

	1991	1990	1989	1988	1987
Higher	**52.5**	53.4	58.0	59.0	53.1
Same	**36.8**	36.8	33.9	31.7	35.0
Lower	**9.5**	8.8	6.5	5.0	6.9
No answer	**1.0**	1.0	1.6	4.3	5.0
	100.0	100.0	100.0	100.0	100.0

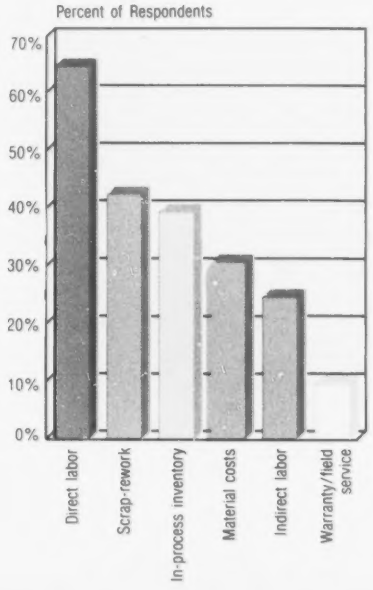
3b. Why?

	1991	1990	1989	1988	1987
Incoming orders on increase	**37.9**	42.1	49.7	46.0	33.0
Incoming orders on decrease	**9.8**	8.6	5.5	4.7	8.7
Incoming orders flat	**26.0**	24.6	19.5	21.2	26.9
Forecast optimistic	**32.8**	31.8	34.3	36.2	34.7
Forecast pessimistic	**6.0**	5.8	5.0	4.9	7.7

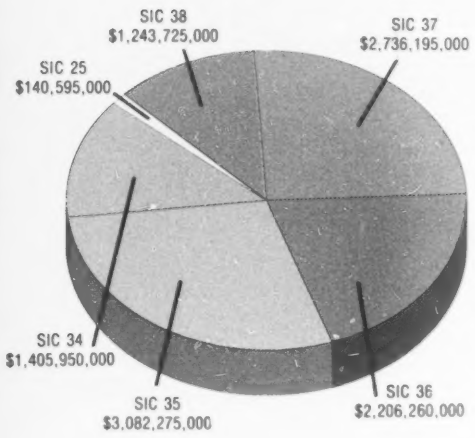
4. Which of these costs are primary targets for capital investment?

	1991	1990	1989	1988	1987
Direct labor	**64.7**	66.6	65.9	67.9	61.2
Scrap-rework	**42.5**	42.3	42.1	32.9	25.4
In-process inventory	**39.4**	40.2	39.4	38.4	28.9
Material costs	**30.7**	32.5	36.4	34.0	29.2
Indirect labor	**24.6**	24.1	25.0	24.7	18.4
Warranty/field service	**9.6**	8.4	10.7	(Not Asked)	(Not Asked)

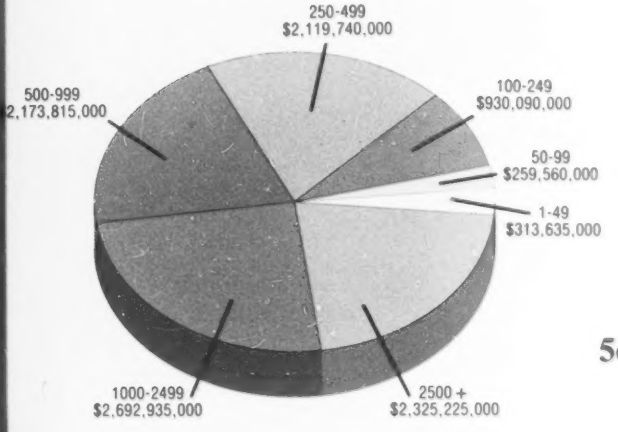
Which of these costs are primary targets for capital investment?



Projected Overall Spending By 2-Digit SIC



Projected Overall Spending By Plant Size



5. In 1991, how much will your plant invest in machinery/equipment?

$10,815,000,000

(Total *projected* 1991 capital equipment spending)

An increase of 0.7% over 1990.

5a. Has the above amount been approved?

	1991	1990	1989	1988	1987
Yes	**38.6**	39.3	38.7	37.1	34.4
No	**59.1**	59.1	58.9	57.9	61.0
No answer	**2.3**	1.6	2.4	5.0	4.6
Total	**100.0**	100.0	100.0	100.0	100.0

5b. If no, when do you expect approval?

	1991	1990	1989	1988	1987
September	**4.8**	4.7	5.0	4.2	3.5
October	**10.1**	9.4	10.1	9.7	8.0
November	**14.5**	14.9	13.5	14.1	16.5
December	**18.8**	19.2	18.2	19.1	17.3
Other	**2.6**	4.2	3.5	10.8	11.9
No answer*	**49.2**	47.6	49.7	42.1	42.8
Total	**100.0**	100.0	100.0	100.0	100.0

*Includes those with approved appropriations—question 5a.

5c. What percent of the indicated total do you expect to be approved?

(The answers to this question are averaged.)	**1991**	1990	1989	1988	1987
	73	73	84	85	67

Note: The median for those plants who report no approval for 1991 budgets is 100%.

5d. What percent of the 1991 budget has already been placed with equipment builders?

(The answers to this question are averaged.)	**1991**	1990	1989	1988	1987
	10	11	12	8	8

Note: The median was 25%. 29.1% of the total respondents have placed 34.2% of their 1991 budget with equipment builders.

6. What percent of the total equipment dollar will be spent on...?

	1991	1990
New equipment	**73.2**	74.9
Used equipment	**13.3**	12.9
Rebuilt equipment	**8.5**	8.2

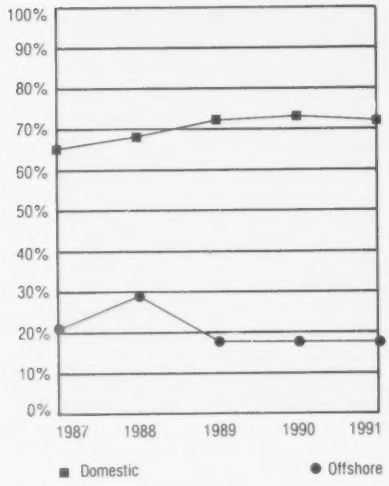
Note: 41% of the total respondents report they will purchase some used equipment.
32% of the total respondents report they will purchase some rebuilt equipment.

7. What percent of the total equipment dollar will be offshore/domestic sourced?

	1991	1990	1989	1988	1987
Domestic	**72**	73	72	68	65
Offshore	**18**	18	18	29	21

Note: The median for domestic source fell to 92% from 95%
The median for offshore source rose to 35% from 30%

What percent of the total equipment dollar will be offshore/domestic sourced?



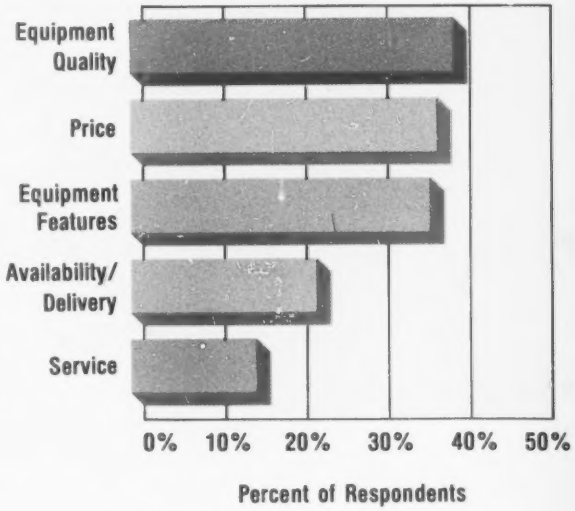
7a. If you are buying offshore equipment, will it be for...

	1991	1990	1989	1988	1987
Cutting	**25.7**	27.6	28.7	29.5	26.4
Forming	**8.1**	7.9	8.6	8.2	7.5
Gaging	**7.7**	8.1	9.3	7.2	8.1
Other	**21.0**	19.8	21.6	15.1	15.5

7b. What influences your offshore purchases?

	1991	1990	1989	1988	1987
Equipment quality	**39.7**	40.3	44.6	39.8	35.5
Price	**37.7**	36.7	40.6	35.1	34.1
Equipment features	**36.8**	37.9	42.0	(Not Asked)	(Not Asked)
Availability/ delivery	**22.9**	22.0	23.9	20.6	20.1
Service	**15.5**	13.5	19.4	12.3	12.1

What influences your offshore purchase?

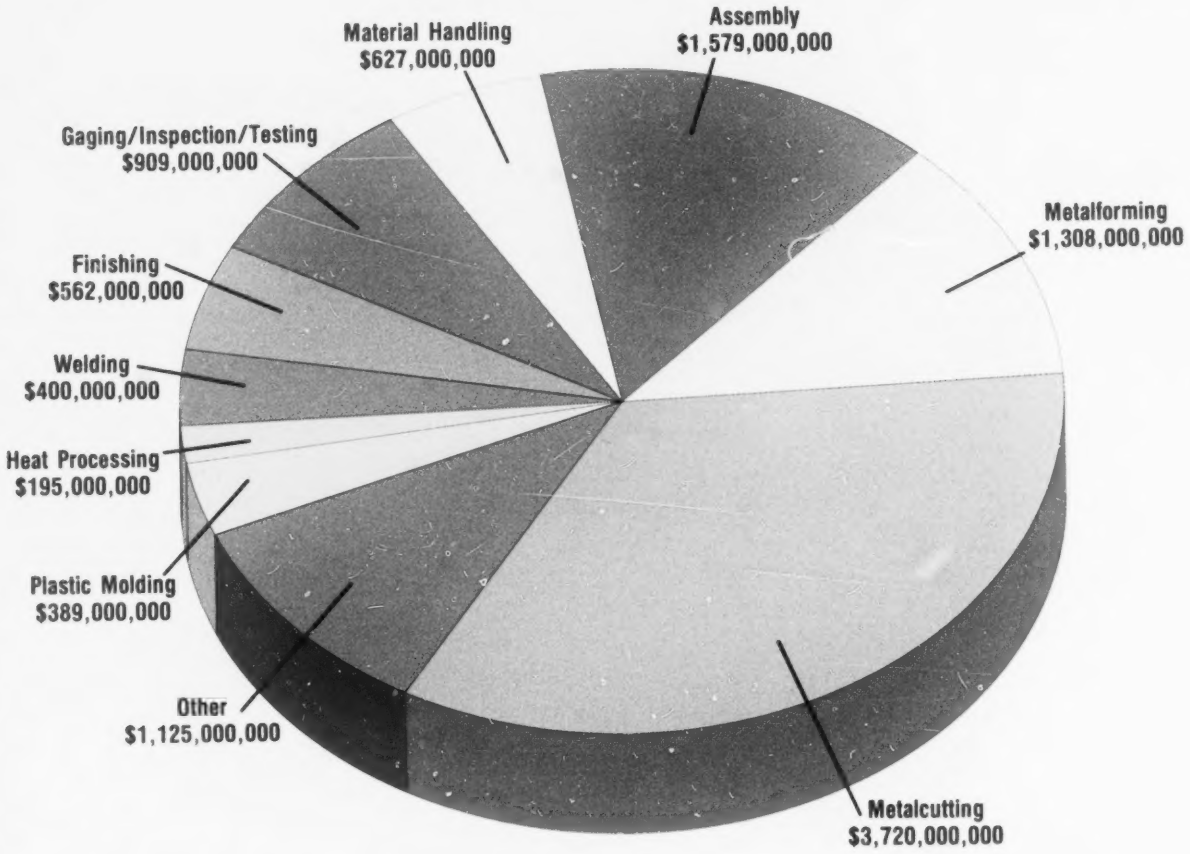


1991 Capital Equipment

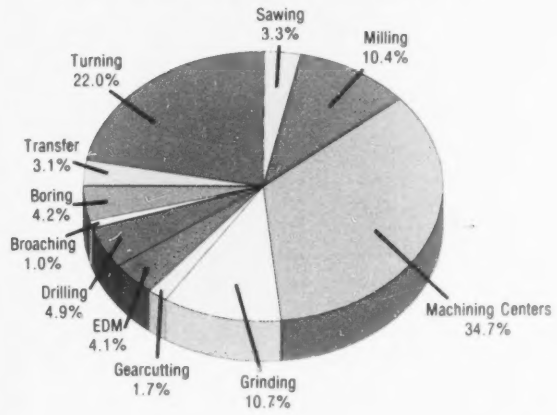
8. What percentage of your 1991 capital equipment expenditure will be invested in each of the listed categories of machinery/equipment?

	1991	% Total Investment
Metalcutting	$3,720 mil Total $2,065 mil Domestic $1,655 mil Offshore	34.4
Boring		4.2
Broaching		1.0
Drilling		4.9
Electrical discharge machining (EDM-ram type)		1.4
(EDM-wire type)		2.7
Gearcutting		1.7
Grinding—flat		4.4
Grinding—cylindrical		6.3
Machining centers—horizontal		18.2
Machining centers—vertical		16.5
Milling		10.4
Sawing		3.3
Turning—horizontal		19.0
Turning—vertical		3.0
Transfer and other special purpose		3.1
Metalforming	$1,308 mil Total $787 mil Domestic $521 mil Offshore	12.1
Blanking and stamping presses		38.1
Punching, nibbling, notching		18.4
Forging and heading		8.0
Brakes and shears		22.4
Sheet/strip/processing feeding		13.1
Assembly	$1,579 mil Total	14.6
Synchronous automatic and semi-automatic		36.6
Non-synchronous automatic and semi-automatic		29.8
Portable power tools		18.7
Other assembly equipment		14.8
Material Handling	$627 mil Total	5.8
Automated storage & retrieval systems (AS/RS)		14.7
Conveyors		32.3
Automated guided vehicles (AGVs)		4.2
Other		48.8
Gaging-Inspection-Testing	$909 mil Total	8.4
Gaging—in process		33.8
Gaging—post process		14.2
Coordinate measuring machines (CMMs)		18.1
Testing		33.8
Finishing Equipment	$562 mil Total	5.2
Cleaning		26.5
Plating		15.5
Painting		39.9
Mechanical		18.1
Welding-Riveting-Brazing	$400 mil Total	3.7
Welding		84.8
Riveting		5.5
Brazing		9.7
Heat Processing	$195 mil Total	1.8
Controlled atmosphere		59.0
Induction		19.1
Vacuum		22.5
Plastic Molding	$389 mil Total	3.6
Injection		75.0
Other		25.0
Other	$1,125 mil Total	10.4

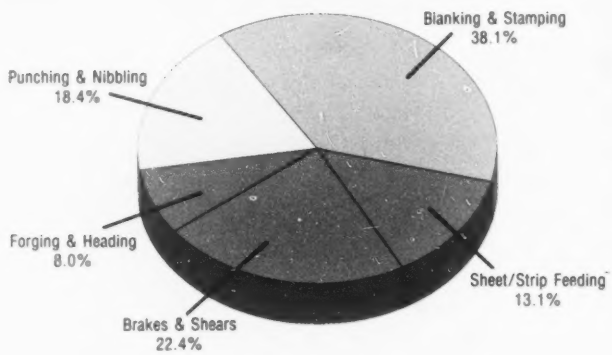
Projected Expenditures



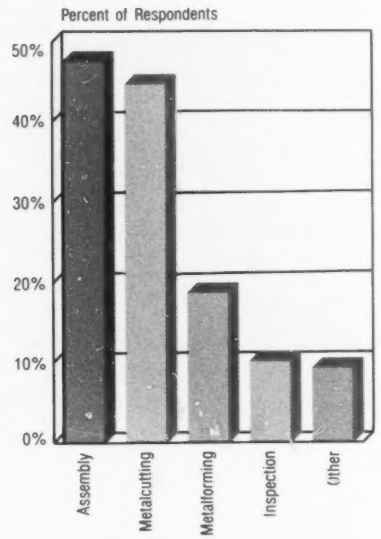
Total Projected Spending For Metalcutting Machines



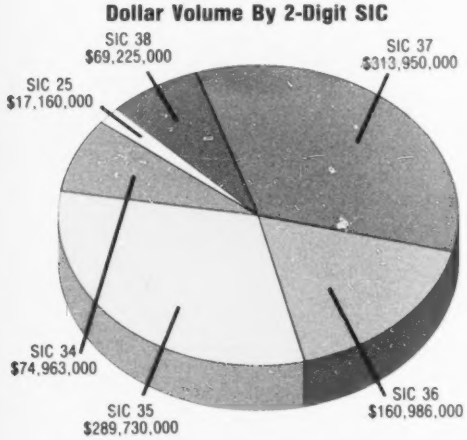
Total Projected Spending For Metalforming Machines



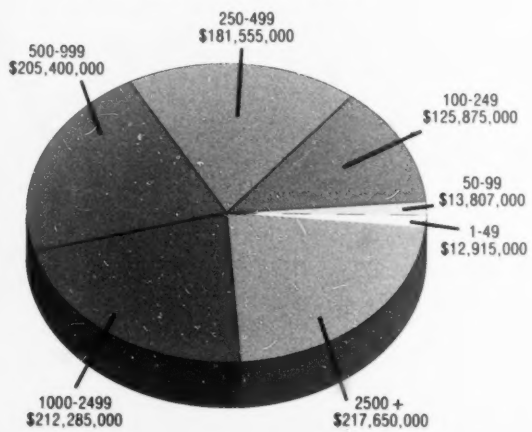
If you plan to purchase cells, the cell's primary function will be...?



Dollar Volume By 2-Digit SIC



Dollar Volume By Plant Size



9. Does your plant currently operate manufacturing cells?

	1991	1990	1989	1988	1987
Yes	**29.0**	23.9	21.8	14.9	14.3
No	**69.2**	74.3	72.2	77.1	81.3
No answer	**1.8**	1.8	6.0	8.0	4.4
Total	**100.0**	100.0	100.0	100.0	100.0

9a. Do your plans for 1991-92 include the purchase of manufacturing cells?

	1991	1990	1989	1988	1987
Yes	**24.4**	22.6	23.0	14.4	15.6
No	**72.7**	73.9	68.9	74.6	78.2
No answer	**2.9**	3.5	8.1	11.0	6.2
Total	**100.0**	100.0	100.0	100.0	100.0

9b. If yes, the cell's primary function will be:

	1991	1990	1989
Assembly	**47.6**	46.4	42.8
Metalcutting	**44.7**	46.5	46.8
Metalforming	**18.7**	18.3	19.3
Inspection	**10.2**	9.3	10.4
Other	**9.3**	4.8	6.9

9c. How much do you expect to spend on manufacturing cells in the next two years?

$969,537,000

(Actual reported spending for 1991-92)

The average plant planning to purchase manufacturing cells will spend $1.94 million on cells in the next two years. The median is $500,000.

10. Does your plant currently operate a flexible manufacturing system (FMS)?

A flexible manufacturing system (FMS) is defined as multiple materials handling devices servicing multiple machines with a computer responsible for coordinating, pacing and scheduling.

	1991	1990	1989	1988	1987
Yes	**13.8**	12.7	10.2	10.5	9.8
No	**82.9**	84.0	84.2	77.6	83.4
No answer	**3.3**	3.3	5.6	11.9	6.8
Total	**100.0**	100.0	100.0	100.0	100.0

10a. Do your plans for 1991-92 include purchase of flexible manufacturing systems (FMSs)?

	1991	1990	1989	1988	1987
Yes	**11.0**	10.6	11.6	11.2	12.6
No	**74.5**	74.5	72.5	73.4	77.5
No answer	**14.5**	14.9	15.9	15.4	9.9
Total	**100.0**	100.0	100.0	100.0	100.0

10b. If yes, the FMS's primary function will be:

	1991	1990	1989
Assembly	**50.0**	55.2	45.6
Metalcutting	**45.7**	33.9	40.7
Metalforming	**19.3**	23.8	16.9
Inspection	**15.7**	14.4	13.2
Other	**5.4**	6.1	5.7

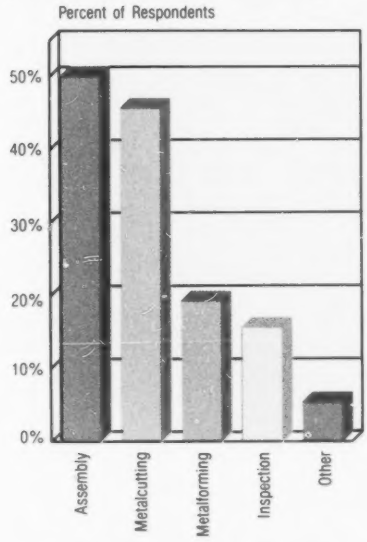
10c. How much do you expect to spend on flexible manufacturing systems in the next two years?

$413,400,000

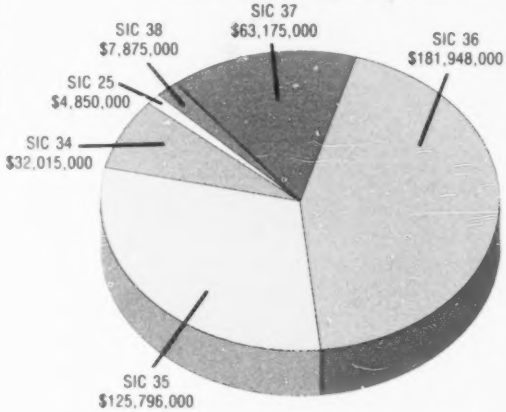
(Actual reported spending for 1991-92)

The average plant planning to purchase flexible manufacturing systems will spend $2.04 million on FMSs in the next two years. The median is $500,000.

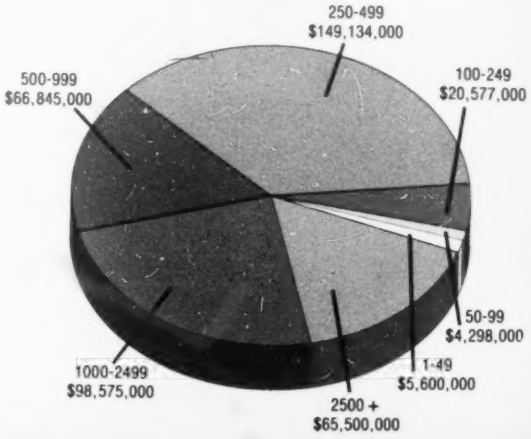
If you plan to purchase an FMS, the system's primary function will be...?



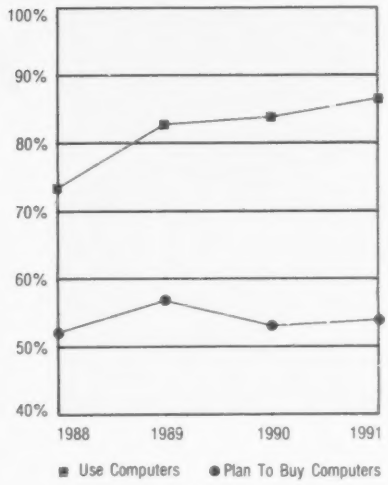
Dollar Volume By 2-Digit SIC



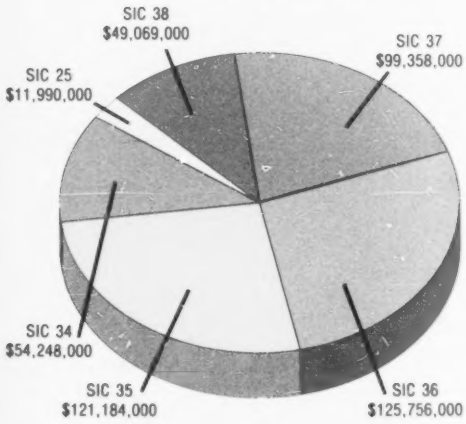
Dollar Volume By Plant Size



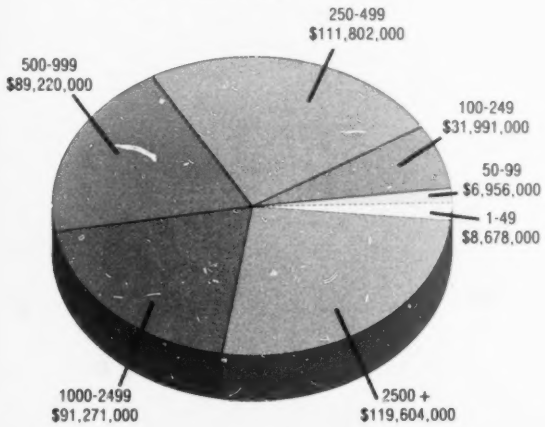
Current Computer Usage and Future Purchase Plans



Dollar Volume By 2-Digit SIC



Dollar Volume By Plant Size



11. Do you currently use computers in your manufacturing operations?

	1991	1990	1989	1988
Yes	**86.5**	83.8	82.7	73.4
No	**12.0**	14.6	15.2	19.1
No answer	**1.5**	1.6	2.1	7.5
Total	**100.0**	100.0	100.0	100.0

11a. Do your plans for 1991-92 include lease or purchase of computers to be used in your plant's manufacturing operations?

	1991	1990	1989	1988
Yes	**53.7**	52.9	56.6	52.0
No	**35.5**	36.0	29.0	36.0
No answer	**10.8**	11.1	13.5	12.0
Total	**100.0**	100.0	100.0	100.0

11b. How much do you expect to spend on computers for manufacturing systems in the next two years?

$459,500,000

(Actual reported spending for 1991-92)

The average plant planning to purchase computers will spend $350,700 on computers in the next two years. The median is $62,500.

12. Do your plans for 1991-92 include the purchase of manufacturing software?

	1991	1990	1989
Yes	**62.5**	60.0	66.8
No	**33.5**	36.7	29.5
No answer	**4.0**	3.3	3.7
Total	**100.0**	100.0	100.0

12a. If YES, the software will be purchased for the following:

		% PC/Mini Based	% Mainframe Based
Computer-aided design (CAD)	**59.9**	83	23
Production control	**45.5**	61	44
NC/CNC programming	**43.3**	86	17
Inspection/quality control	**38.1**	83	22
MRP/MRP II	**33.0**	44	61
Estimating and quoting	**30.0**	77	28
Maintenance scheduling	**29.3**	80	25
Process analysis, simulation	**19.0**	83	21
Part analysis, simulation (e.g., finite element)	**18.3**	82	22
Group technology/ computer-aided process planning (GT/CAPP)	**12.9**	71	35
Other	**4.9**	62	43

12b. Are purchases of manufacturing software considered to be capital expenditures?

	1991	1990
Yes	**61.0**	60.5
No	**39.0**	39.5

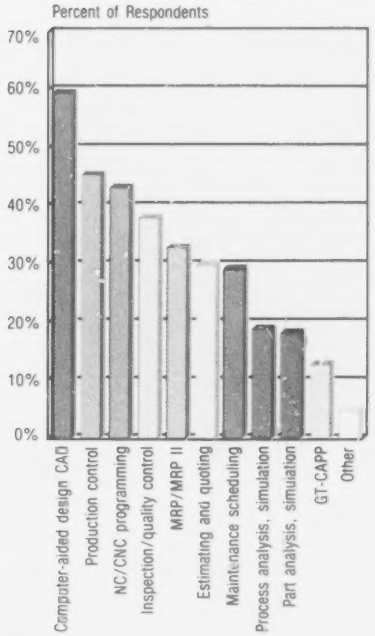
12c. How much do you expect to spend on manufacturing software in the next two years?

$205,100,000

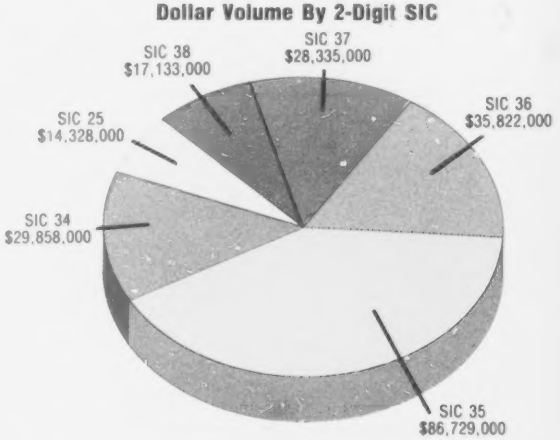
(Actual reported spending for 1991-92)

The average plant planning to purchase software will spend $181,000 on software in the next two years. The median is $40,000.

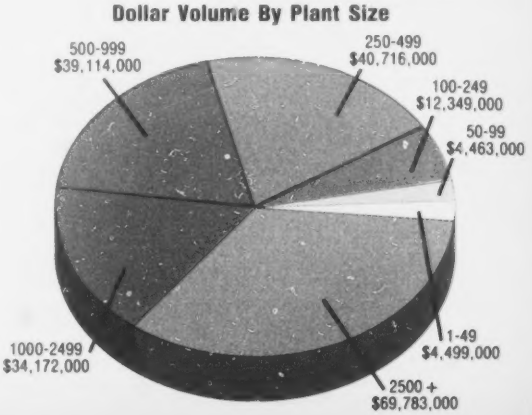
If you are purchasing software, what will it be used for?



Dollar Volume By 2-Digit SIC



Dollar Volume By Plant Size



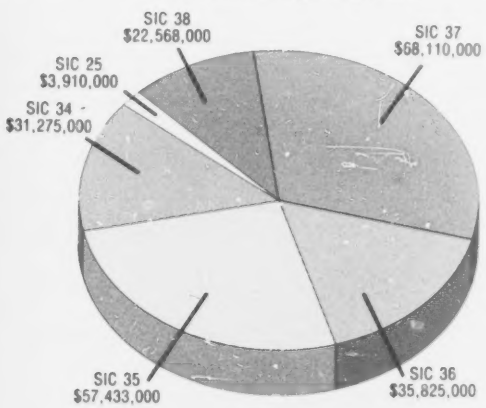
13. Do your plans for 1991-92 include purchase of lasers?

	1991	1990	1989	1988	1987
Yes	**12.8**	11.2	13.1	11.1	12.5
No	**84.5**	86.4	84.6	80.7	84.4
No answer	**2.7**	2.4	2.3	8.2	3.1
Total	**100.0**	100.0	100.0	100.0	100.0

13a. If yes, for which of the following applications?

	1991	1990	1989
Gaging/ measurement	**50.7**	47.5	46.0
Cutting	**44.2**	40.2	36.6
Welding	**20.5**	28.0	20.9
Drilling	**12.0**	16.9	14.1
Heat treating	**4.8**	3.8	5.2

Robots:
Dollar Volume By 2-Digit SIC



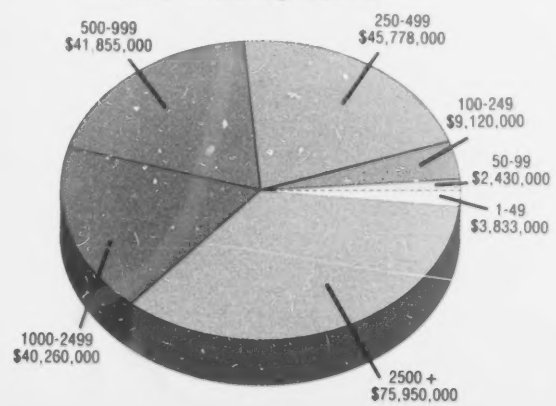
14. Do you currently use robots in your plant?

	1991	1990	1989	1988	1987
Yes	**23.9**	22.7	24.3	19.2	29.4
No	**74.7**	75.7	74.4	73.4	63.5
No answer	**1.4**	1.6	1.3	7.4	7.1
Total	**100.0**	100.0	100.0	100.0	100.0

14a. Do your plans for 1991-92 include the purchase of robots?

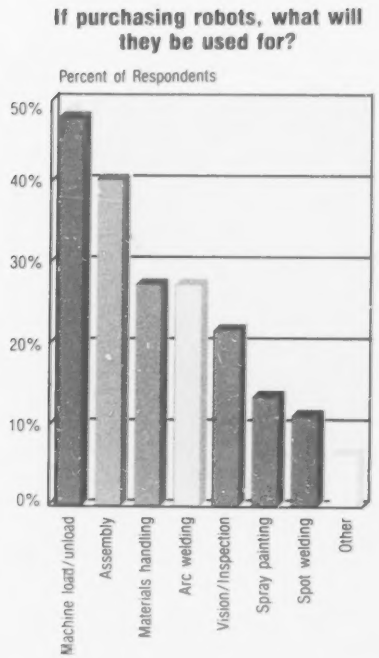
	1991	1990	1989
Yes	**25.1**	22.7	21.7
No	**74.9**	75.7	72.2
No answer	**—**	1.6	6.1
Total	**100.0**	100.0	100.0

Robots:
Dollar Volume By Plant Size



14b. If yes, in which of the following types of operations will robots be used:

	1991	1990	1989
Machine load/ unload	**47.8**	50.4	49.1
Assembly	**40.2**	41.9	47.1
Materials handling	**27.3**	30.1	31.5
Arc welding	**27.3**	29.4	24.5
Vision/Inspection	**21.7**	(Not Asked)	(Not Asked)
Spray painting	**13.5**	14.8	15.3
Spot welding	**11.2**	10.9	11.2
Other	**6.4**	3.7	4.5



14c. How much do you expect to spend on robots in the next two years?

$219,200,000

(Actual reported spending for 1991-92)

The average plant planning to purchase robots will spend $592,000 on robots in the next two years. The median is $150,000.

FOR MORE INFORMATION...

PRODUCTION's Annual Capital Equipment Spending Survey is the largest, most comprehensive (and most expensive) survey detailing future spending in the discrete parts manufacturing industries. It generates a wealth of information. So much information, in fact, that it simply cannot be presented in detail in a brochure like this.

If you feel that more detailed information would be of use to you or your company, we would be pleased to discuss your specific needs. Demographic detail (SIC, plant size, geographic location, etc.) is available for every product category as well as virtually every question in the survey.

And, there certainly are ways to use the information available here that we haven't necessarily thought of. We welcome your creative ideas, and we will do our best to get you the useful information you need.

Feel free to contact your District Sales Manager, or call Jane Sweatt, Data Processing Department, Gardner Publications, Inc., 513-231-8020.

PRODUCTION
THE MAGAZINE OF MANUFACTURING MANAGEMENT

6600 CLOUGH PIKE • CINCINNATI, OHIO 45244-4090
TELEPHONE: 513-231-8020 • FAX: 513-231-2818 • TOLL FREE: 1-800-950-8020